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oughness and exactness of which she is capable. Nature's contrivances for the maintenance of life in all its wonderful and varied phases are inexhaustible, and we are ever laying down rules and theoretical laws, only to find them violated and upset, as we more truly interpret her ways. She is as watchful of the myriad invisible atoms that mantle o'er the pond with green, or of the unseen swarms that fill the air "though one transparent vacancy it seems," as she is of the higher forms of life. Plastic, she conforms in every conceivable and inconceivable way to the wants of her immense family. She shows us

> "The ant's republic and the realm of bees;
> How those in common all their stores bestow,
> And anarchy without confusion know;
> And these forever, tho' a monarch reign,
> Their separate cells and properties maintain,"

and calls loudly on us to read aright and solve her yet many untold secrets.

THE FLORA OF THE DISMAL SWAMP.

BY PROF. J. W. CHICKERING, JR.

A few notes of a recent botanical trip to the Dismal Swamp, that romance of our geographies and Moore's ballad, giving its characteristic flora, with the species found in flower, may not be wanting in interest.

Sunrise, on the morning of April 11th, found our party of two, Mr. William H. Seaman of Washington, and myself, just ready to make the landing at Old Point Comfort. A stroll before breakfast, for a mile or two along the sandy point, brought us to small groves of pitch pine (*Pinus rigida*), interspersed with thickets of dwarf live oak (*Quercus virens* var. *maritima*), here reaching its northern limit, while inside the fortress the true live oak attains quite a large size. The prickly pear (*Opuntia vulgaris*), is scattered along the sand, and on one almost inaccessible edge of the rampart displays its reddish fruit. Along the ramparts occur the bright blue spikes of the grape hyacinth (*Muscari botryoides*), with *Lamium amplexicaule*, *Sisymbrium Thaliana* and *vicia*. A walk of a couple of miles to Hampton reveals nothing of special interest, *Viola cucullata* and *primulæfolia* being the only species noticed. The suburbs of Norfolk abound with pride of China (*Melia azedarach*), still retaining its whitish drupes, three or four species of magnolia and other distinctively southern trees, while *Yucca gloriosa* flourishes most thriftily on heaps of garden rubbish.

The next morning a little steamer received us for our trip, up the Elizabeth River, through the Dismal Swamp Canal, and down the Pasquotank River, to Elizabeth City, N. C., forty miles in all.

The swamp region is of indefinite extent, being estimated at from six hundred to one thousand square miles, thirty miles or more from north to south, and twenty or more, from east to west. Much of it has been cleared and partly drained, here and there a clearing of several hundred acres meeting the eye, said to be capable of producing fifty bushels of shelled corn to the acre, while at rare intervals appear neat, white and inviting mansions.

It seems originally to have been heavily wooded. The cypress (*Taxodium distichum*), juniper (*Juniperus Virginiana*), tulip tree (*Liriodendron tulipifera*), and the sweet and sour gums (*Liquidambar Styraciflua* and *Nyssa uniflora* and *aquatica*), are abundant and attain a large size.

Most of the large trees, however, have been cut off, or have fallen victims to the frequent fires, several of which were raging during our visit, and lighted up the horizon at night; often by these fires, the peaty soil for miles is burned to the depth of four or five feet; the hollow thus formed soon fills with water, and ever after retains a truly "dismal" appearance. But, for the most part, the swamp exhibits almost tropical luxuriance, the true canebrake almost forbidding passage. The foliage at this season is largely evergreen, the maples being only partially in leaf and the cypress but beginning to put forth its delicate leaflets. *Ilex glabra*, inkberry, or, as it is called there, gall-berry, is the most abundant shrub, especially along the watercourses, occurring, from two to ten feet in height, its black berries contrasting finely with its glossy leaves. The sweet bay (*Magnolia glauca*), the holly (*Ilex opaca*), often with its scarlet berries, the great laurel (*Rhododendron maximum*), and perhaps loblolly bay (*Gordonia Lasianthus*), are very abundant; while climbing high over all is the *Smilax laurifolia*, with its large, stout, evergreen leaves, appearing as if pinnately compound, and lower down the green-brier (*S.*

rotundifolia), weaving almost impassable barriers with its tough prickly stems, also *Myrica Gale*, and *Leucothöe Catesbæi.* But most beautiful of all, at this season, is the yellow jessamine (*Gelsemium sempervirens*), twining around trees to the height of twenty or thirty feet, covering thickets, hanging in festoons from the branches, and throwing out everywhere its racemes of golden yellow blossoms, loading the air with its fragrance. It has but one drawback, the frequent tendency of its perfume, in a close room, to cause headache and other disagreeable symptoms.

Of deciduous trees and shrubs, just opening, we noticed *Acer rubrum* and *dasycarpum*, horse-sugar, *Symplocos tinctoria*, a beautiful shrub, worthy of cultivation, *Pyrus arbutifolia*, *Quercus salicifolia*, and very abundantly *Rubus villosus*, with two or three species of *Vaccinium* and *Gaylussacia.* Along the canal banks, and at times, in large masses, forming almost impenetrable canebrakes, from two to twenty feet in height, we found *Arundinaria gigantea* and *tecta*, being fortunate enough to detect the former in flower, on the shorter stems. This is a most troublesome weed in the clearings, its matted roots resisting everything but fire or a breaking-up plough.

Leaving the steamer and paddling three miles up a smaller canal to Lake Drummond, we met with *Osmunda regalis*, *Claytoniana* and *cinnamonea*, in great abundance and luxuriance; also *Typha latifolia*, *Nesæa verticillata*, great quantities of *Saururus cernuus*, *Onoclea sensibilis*, *Mitchella repens*, *Viola primulæfolia* and *Orontium aquaticum*, only the last two being in flower. The lake is about six miles long by four wide, and is so bordered by cypress swamp, that except in a boat no access to it can be had. The water is as dark as brandy, but not unpalatable nor unhealthy. Fish are quite plenty. We saw no animals, though foxes, "possum" and "coon" are plenty, and bears and deer are seen occasionally. Birds too are scarce; now and then a turkey buzzard sails slowly overhead, or a hawk starts up from an old stump, or a flock of crows wind their noisy way from wood to cornfield, but very few of the sparrows or flycatchers or other cheerful occupants of ordinary woods meet the view. For the most part silence and solitude reign supreme.

Around Elizabeth City, the ground is dry and the soil good, and we found in addition to species already enumerated *Senecio tomentosus*, *Asarum arifolium*, *Ranunculus pusillus* and *bulbosus*, *Anemone nemorosa*, *Arabis lœvigata*, *Barbarea vulgaris*, *Callitriche verna*, *Proserpinaca palustris* and *pectinacea*, *Hydrocotyle umbellata*, and *Sagittaria*. On the trunks of the fine elms along the streets is found, very abundantly, *Polypodium incanum*, its root-stocks creeping over the bark, and covering them with its delicate fronds to a height of twenty feet. Though apparently dry and dead, upon being brought home and placed in a fernery, the fronds began to expand and some new ones were seen putting forth. A later trip would doubtless reveal many more species, but with the drawback of possible chills and certain yellow flies and mosquitoes.

INJURIOUS AND BENEFICIAL INSECTS.

BY A. S. PACKARD. JR.*

THOUGH the reporter was absent during most of the past season, and was unable, except in a slight degree, to make any special investigations on the habits of our more injurious insects, yet with the help of others some new material is here offered that may be serviceable to farmers and gardeners. The facts that we have to present may often seem disconnected and desultory, but few except experts in natural history are perhaps aware how difficult and prolonged a task it is to follow out the transformations of any particular insect, and study thoroughly its habits in its different stages of growth. Unlike birds, quadrupeds and fishes, which have similar habits at all stages of growth, an insect, with its three separate stages of larva, pupa and adult, leads as it were three lives, with different surroundings, and in each of those stages may be regarded as a different animal. Then it is often extremely difficult to ascertain to what beetle or moth or bee such or such a grub or caterpillar belongs. Our entomologists are not numerous enough, and often from their time being taken up with the pursuits of their profession, usually not that of science, are unable to spend the time in the field to observe the

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*Third Annual Report on the Injurious and Beneficial Insects of Massachusetts, being a reprint, with corrections, from the 20th Annual Report of the Secretary of the Massachusetts Board of Agriculture, 1873.